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The Plant Disease Survey

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INTRODUCTION

The present number of the Bulletin treats of the principal diseases of cotton, sweet potato and corn. The information is presented under three headings as follows: (1) Reports for 1918, which briefly summarize the information received from our collaborators up to October 1: (2) 1917 losses taken from the crop loss estimates for 1917 issued March 15, 1918, in No. 1, Vol. II of the Plant Disease Bulletin; and (3) summary of reports prior to 1918.

The 1918 reports are necessarily incomplete at this early date but will suffice to show the general distribution of the various diseases this season and to give an indication of the losses they are causing. The summary of reports for past years is made up from the accumulated data received from our collaborators, together with published statements in federal and state bulletins and reports. There is very little information available on many diseases and in no case is the quantity of data large except for the past few years. It will be recalled that the 1917 crop loss estimates were compiled after repeated consultation with both federal and state pathological workers throughout the United States, and they represent the combined judgment of those qualified to form an opinion. The figures submitted should be significant in connection with the accompanying summaries for present and past years.

We are also indebted to the following specialists for information used in preparing the summaries of the diseases mentioned: Dr. Oswald Schreiner, Office of Soil Fertility Investigations, Bureau of Plant Industry, for information on potash hunger of cotton; Mr. L. P. Byars, Office of Cotton, Truck and Forage Crop Disease Investigations, Bureau of Plant Industry, for information on root knot of cotton; Dr. W. H. Tisdale, North Carolina Agricultural Experiment Station, for information on Physoderma disease of corn; and Dr. G. N. Hoffer, Indiana Agricultural Experiment Station, for the report on root and stalk rots of corn.

While these summaries should be of interest to all pathologists concerned with the diseases of cotton, sweet potatoes and corn, it is believed that they will be of special value at the time of the conference on diseases of these crops called at Birmingham, Alabama, October 18-20, by Prof. H. W. Barre of Clemson College, Commissioner for the South, War Emergency Board of American Plant Pathologists.

COTTON.

Anthracnose caused by Glomerella gossypii.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918
Va.	One of most important cotton diseases. Severe locally.		
Tenn.	Unobserved up to middle of September.	3%	Local, usually of slight importance.
N. C.	Half and Half variety severely injured, as high as 50% infection noted. Other varieties usually show less than 5% infection, special selections less than 1%.	5%	General, unusually severe in 1913 and 1916.
S. C.	Severe on Sea Island cotton. Long Staple and some Short Staple varieties. Infection often as high as 20%, but in general less severe than usual.	4%	Always severe. Causing heavy losses.
Ga.	Common. Damage 12 to 15%. Considerable damage in August following rain.	5%	Generally distributed, causing considerable loss.
Fla.		5.5%	Local, moderately severe.
Ala.	Less serious than usual, probably due to the very dry season. Not severe in southern Alabama; northern part of state not visited.	3%	General and severe, especially in northern Alabama.
Miss.	General but not abundant except where gin-run seed was used. 20% loss in 200 acres near Helm.	4%	Very serious in 1910; general and moderately severe in other years.
La.	Not important, due to dry weather. Average loss 5 to 10%.	4%	General and moderately severe.
Tex.	Not prevalent up to middle of September.	2%	General, causing moderate loss.
Okla.	Has not been found this year.	2%	Local, loss usually slight.
Ark.	Becoming serious within past few weeks.	2%	General, at times severe.

Wilt caused by Fusarium vasinfectum.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918
Va.	Considerable injury in some fields.		
Tenn.	Damage is severe locally.	1%	Slight.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918
N. C.		4%	Reported as local from 1903 to 1905, general and serious since then.
S. C.	General. Severe in many counties. Average loss about 5%, Wilt-resistant varieties have all stood up remarkably well except in occasional fields where root knot is prevalent.	3%	General for the past twelve years; usually causing serious damage.
Ga.	General, especially in southern districts. Where resistant strains were not used many fields in the coastal plains show a total loss. 5 to 10% average damage.	4.8%	Common and serious throughout state.
Fla.		2.5%	Usually slight.
Ala.	General through southern part of state and probably causing more damage than usual. Most serious cotton disease this year.	4.5%	Generally distributed. Very serious since 1905.
Miss.	Present locally, unimportant this year.	3%	Prevalent throughout state, causing moderate losses.
La.	General in state, especially on upland and sandy soils. Is spreading. Presence of boll weevil makes it difficult to estimate losses. No satisfactory wilt-resistant variety for this district.	2%	Common and usually serious in all cotton producing regions.
Tex.	Serious on sandy soils. Loss about 5%.	1%	Locally serious.
Okla.	Local; injury slight.	1%	Local and unimportant.
Ark.	Generally distributed. Severe only in eastern and southern counties.	4%	General and serious.
Mo.			Reported for this state in 1906.

Root Knot caused by Heterodera radicicola.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918.
Va.	Was not reported as found.		
Tenn.	Unimportant.	.7%	Not serious.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918.
N. C.	Damage somewhat greater than last year.	2.8%	Usually causing considerable loss.
S. C.	Common and causing serious damage in the central portion of state, especially where Dixie cotton has been planted to control wilt. More damage than last year.	4.1%	General; especially serious in 1917.
Ga.	Loss for state probably about same as last year.	4.1%	Serious, especially in southern part of state.
Fla.	More severe than last year.	3.5%	Often causing heavy loss.
Ala.	Common. Loss about same as last year.	3.5%	Usually general and severe, especially in 1917.
Miss.	Less prevalent than usual.	2.8%	Serious in 1917.
La.	Not observed to any extent.	2.8%	Usually not of great importance.
Tex.	Prevalent but not serious, on account of drought.	.7%	Local.
Okla.	Less damage than usual on account of drought, but in isolated sections causing 10 to 20% loss.	.7%	Local.
Ark.	Quite prevalent in southern part of state but damage reduced by dry weather.	2.8%	Usually local and comparatively unimportant.

Angular Leaf Spot and Bacterial Boll Rot caused by Bacterium malvacearum.

State	Reports for 1918	Summary of Reports prior to 1918.
Va.	Not common and does little damage.	Local and unimportant.
Tenn.	General. Damage slight.	General and severe in 1917, not serious in other years.
N. C.	General on leaves. Very little boll infection. Damage slight.	Noted in 1907. Reported as local in 1910 and general since about 1913. Not severe.
S. C.	Noticed in some fields. Damage slight.	General and of moderate severity.

State	Reports for 1918	Summary of Reports prior to 1918
Ga.	Very common but usually not serious. Percentage of infection about 5% for state; damage not over 1%. Damage 5 to 100% in individual fields.	Reported locally.
Fla.		Local.
Ala.	Noticed in rather severe amounts in many fields during early season; checked by dry weather. Considerable leaf shedding probably partly due to early infection.	General and producing a medium amount of damage.
Miss.	General over the state. Infection varies from trace to severe rusting of leaves depending somewhat on the variety and on soil and climatic conditions.	Generally distributed over state; producing only a slight loss.
La.	Reduced by dry weather but has developed considerably in regions where rain has fallen.	Very severe and general in 1909. Moderate since then.
Tex.	Not prevalent.	General and of little importance.
Okla.	Quite prevalent in many sections. Varying from trace to 100% infection.	General and very severe in 1917.
Ark.	General but not severe on account of severe drought.	Common in all cotton districts and of moderate importance.

Texas Root Rot caused by Ozonium omnivorum.

State	Occurrences 1888-1918 inclusive (Texas only state reporting 1918)
Tenn.	Local but of little importance.
S. C.	Reported.
Tex.	Noted as early as 1888 at which time it was general and causing considerable damage, continuing so up to the present time. The most serious disease of cotton in state in 1918.
Okla.	Local and causing very slight damage.
Ark.	Local, giving practically no trouble.
N. Mex.	Local and producing some damage.
Ariz.	Noted.

Diplodia Boll Rot caused by Diplodia gossypina.

State	Occurrences 1908 to 1918 inclusive (South Carolina and Louisiana only states reporting in 1918.)
Tenn.	Local. Loss slight. First noted 1917.
N. C.	Distribution general, with little injurious effect. First report 1917.
S. C.	Common throughout state, producing 5-25% crop injury. No report until 1917. Not as severe 1918 as 1917. Worst in eastern section especially in rank dense cotton.
Ga.	General distribution. Infection slight.
Miss.	Common in all cotton regions. Severe in parts of state, particularly in low places on lower branches.
La.	General. Usually of moderate severity except in 1917 when it was less severe than usual. First reported 1908. Very slight 1918.
Tex.	General and moderately severe.
Ark.	Local.

Leaf Spot caused by Macrosporium nigricantium.

Reported from Arkansas, Tennessee, South Carolina, Alabama, Mississippi, and Louisiana. It seems to be fairly generally distributed but is not of any particular importance. When it was first reported from Alabama however, in 1907 it was said to be severe. No record of severity since that time.

Stem Rot or "Sore Shin" caused by Rhizoctonia sp.

Reports are available from the following states:- Texas, Louisiana, Arkansas, Mississippi, Alabama and North Carolina. First reported 1899 from Alabama. Is not said to be of economic importance. Only record of severity is one in 1910 from Louisiana when it was general and severe.

Cercospora Leaf Spot caused by Cercospora gossypina.

Occurs locally in most of the cotton states. No reports from Mississippi, Arkansas or Tennessee, however. Reported from Alabama as early as 1899. Louisiana reports the most loss (1917). In general disease is unimportant.

Ramularia areola.

Reported from South Carolina, Alabama, Mississippi and Louisiana.

Malnutrition - largely Potash Hunger.

Malnutrition troubles, largely due to lack of sufficient available potash in the soil, have been the most important single factor with which the cotton crop has had to contend this year, in the opinion of the Office of Soil Fertility Investigations which has been making special studies in this field. Potash hunger is especially serious on the light soils of the Coastal Plain sections of the South Atlantic and Gulf States, but also occurs in the Piedmont and other sections, and is causing greater damage this year than last. The accurate diagnosis of the disease is not easy, as symptoms resembling those of potash hunger are caused by red spider (which has been troublesome this season), by other malnutrition conditions, and by various factors which induce prematuring of the plants. The drought this year has also complicated the situation. There is no doubt however, that use of manure or potash fertilizers checks the disease. Potash hunger renders the plants especially susceptible to other diseases, thus complicating the estimate of losses.

Few reports of this disease were received from our collaborators prior to 1917, but the malady was mentioned in experiment station reports, especially of Alabama and North Carolina, more than twenty years ago. Townend Glover (Rept. of Comm. of Patents 1857, p. 123) mentions "rust", which was probably a malady of this nature, as occurring in Tennessee and Mississippi in 1857.

State	Summary of State Reports.
Va.	Has not come to the attention of the collaborator.
Tenn.	Local. Damage slight.
N. C.	Severe in certain counties of the Coastal Plain and in part of the southern Piedmont district.
S. C.	Varies in amount in different regions. General in the Coastal Plain. The loss due to potash hunger varies from 10 to 60%, causing an average loss of about 20 to 25%.
Ga.	Severe, especially in the Coastal Plain.
Ala.	Very noticeable on the lighter soils where no potash or stable manure was applied.
Miss.	Evidence of potash hunger are scattered generally over the state; not severe in most sections.
La.	Considerable loss this year from the so-called "rust". Severe locally.
Tex.	Local and usually not important.
Okla.	Slight and locally distributed.
Ark.	Severe on the "Gouch-shot" lands of the Arkansas and other river bottoms. In general local and slight.

SWEET POTATO

Stem Rot caused by Fusarium batatatis and F. hyperoxysporum.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918.
N. J.	Very abundant and causing large losses.	10%	Abundant and general, causing serious losses.
Del.	Common to the entire sweet potato district. Doing little damage in lower Kent County (1% probably)where pox is most active. In nearly all vicinities of Sussex County the damage will average 20 to 35%. Some areas are severely hit, especially west and southwest of Laurel. Losses as high as 50 to 75% west of Delmar, Averaging 25%.	5%	General prevalence and of moderate seriousness.
Md.	Worst enemy of sweet potato in this district. General. Most severe in districts getting seed stock from Delaware. Some fields show 30% injury.	5%	Very prevalent. Percent of crop injured ranged up to 50%.
Va.	Abundant on Eastern Shore. Causing much trouble in King George County.	3%	General and serious.
N. C.	Occurs to greater or less extent throughout state but on the whole the damage has not been great. Considerable loss to potatoes where seed was obtained from Delaware.	2%	Occurs in the Coastal Plain area, causing moderate injury.
S. C.	Found in a number of fields but causing no serious losses. Fields rather free from disease this season due to use of slippings.	2%	Local and of slight importance.
Ga.	No reports received to date (Oct.15)	2%	Local and not important.
Fla.		2.5%	Reported only for 1917 as being commonly observed in most of the places where sweet potatoes are grown. Somewhat serious.
Ala.	Reported but loss is small, about 1%	2%	Common, southern part state.
Miss.		2%	Rather common.
La.	Becoming established throughout state and is likely to be very important. Scarcely known before the growers began shipping fn potatoes and slips for cuttings.		Reported for the first time in 1917 and at that time as being local in distribution and causing very slight injury.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918
Tex.	Not prevalent	1%	Local and unimportant.
Okla.	Many fields in southeastern part of state badly damaged. Where slips and potatoes were brought in from Arkansas the disease was found.	2%	Local.
Ark.	General, particularly in the western part. Severity ranges up to 60%.	2%	Local and not serious.

Stem Rot is also reported as usually being present but of slight importance in Vermont, New York, Kentucky, Tennessee, Indiana, Wisconsin, Missouri, Idaho, Washington and Oregon. Ohio and Illinois reported 2% loss in 1917, Iowa 5%, Kansas 2.5%. California reported a local epidemic in 1904, a general and serious outbreak in 1910, and 2% loss in 1917.

Black Rot caused by Sphaeronema fimbriatum.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918
N. J.	Very abundant.	5%	Reported in 1890. Generally distributed and very destructive in 1912. Prevalent and serious since then.
Del.	The amount of damage to the stand not as heavy as previous years.	5%	Scattered throughout state in 1906 but only of slight importance. Since then the disease has increased in seriousness until 1912-13 when the loss was large. After that has been less serious.
Md.		8%	General and serious as early as 1905.
Va.	Abundant along Eastern Shore. Reported from Chesterfield County.	4%	Local in distribution and not especially important.
Ky.		0	Local and unimportant.
Tenn.		15%	Locally distributed. Not many reports in possession of Survey.
N. C.	Quite general. Some bad cases causing entire loss of crop. Damage has been limited to certain localities.	7%	Moderately serious throughout state. In 1917 caused enormous losses in storage.
S. C.	Apparently more common than usual. Will cause trouble in storage.	7%	Generally distributed and becoming more serious.

State:	Reports for 1918	1917: Loss:	Summary of Reports prior to 1918
Ga.		5%	General in seed beds, especially in southern part.
Ala.	Loss is small, ranging from 3 to 5%	8%	Quite common.
Miss.		8%	General and in 1917 considered the most destructive of all sweet potato troubles, both in field and storage.
La.	Abundant but not usually serious.	4%	Serious in 1913 but usually not severe.
Tex.	Serious in many places.	5%	Distributed over state, becoming more serious annually.
Okla.	Prevalent in many districts, especially where imported seed was used.	4%	Local and usually of slight importance.
Ark.	Not very serious.	3%	Generally distributed.

Black rot is also a serious disease in some of the northern and western States which raise sweet potatoes, Illinois reporting 4% loss in 1917, Ohio, Indiana and Missouri 2% each, New Mexico 10% and California 6%.

Root Rot caused by Ozonium omnivorum.

General and serious throughout the sweet potato region of Texas. Reports from Arkansas (1910), Oklahoma (1917), New Mexico (1917) and Arizona (1916).

Foot Rot caused by Plenodomus destruens.

This disease is abundant this year in the Eastern Shore section of Virginia and Maryland. Virginia reported the disease as serious in 1915 when 50% of the crop was destroyed. It was reported from the Dismal Swamp section in 1912-13. Ohio, Iowa and Missouri also report the disease as occasionally serious.

Pox and Soil Pit caused by Cystospora batata.

Reported from Delaware, New Jersey, Maryland and Texas. In Delaware this year it was very plentiful from below Felton to Harrington and eastward to Frederica, Houston, Milford and Lincoln. Found also in the district south of the above area but not doing much damage. On a farm near Houston damage amounted to 85%. Last year it was reported for the first time from Maryland. It was said to be prevalent in the southeast part but not causing any great loss.

Scurf caused by Monilochaetes infuscans.

According to reports in possession of the Survey the disease occurs in New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Alabama, Arkansas, Texas, Ohio, Illinois, Iowa, Kansas, California. In some places and in some years it affects quite a large percentage of the crop.

Dry Rot caused by Diaporthe batatis.

Reported from New Jersey, Virginia, Kentucky, North Carolina, South Carolina, Alabama, Mississippi, Arkansas, Indiana, Texas. Not said to be very serious.

White Rust caused by Albugo ipomoeae-panduranae.

Reported in years past from New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas and Iowa. Of slight importance only.

Leaf Spot caused by Septoria bataticola.

Reported as of slight importance in the states of New Jersey, Delaware, Maryland, Virginia, Iowa, Kansas, Alabama and Arkansas.

Leaf Blight caused by Phyllosticta batatae.

Reported from New York, New Jersey, Maryland, Virginia, Kentucky, North Carolina, Georgia, Alabama, Mississippi, Louisiana, Illinois, Iowa and Kansas.

CORN

Wilt caused by Bacterium stewarti

State	Reports for 1918	Summary of Reports prior to 1918
Mass.		Reported as frequent in 1917.
N. Y.	Reported very slight locally.	Not reported to Survey since appearance of Stewart's description in 1897 when it was prevalent in nearly all parts of Long Island. In some cases crop ruined. 20-40% loss frequent. One report 1917.
N. J.	Very slight locally.	Several reports each year since 1913.
Pa.	5% locally.	Reported in 1916 and was severe locally in south in 1917.
Del.		Reported 1912-15 inclusive. Rather severe locally.
Md.	Very slight locally.	First reported 1908. No other report till 1917 when it was very severe locally.
Va.	Prevalent in gardens in Blacksburg. As high as 15% infection observed.	One report 1915.
Tenn.	2-3% in one field. General about Newport.	No report since 1909.
Ky.		Rather severe locally in 1917.

State	Reports for 1918	Summary of Reports prior to 1918
Ga.		Reported in 1916.
Okla.		One report in 1916. First report from the state.
Ohio		Only one report, 1915.
Mich.		Report 1912.
N. Mex.		Less than 1% in 1915. Very severe locally, 1917.
Cal.		First report 1909. Only other report 1917.

Physoderma Disease caused by Physoderma zeae-maydis.

State	Occurrences 1912-1917.
N. J.	Reported from three places in 1917. The record from Passaic, N. J., is the northernmost record in the east.
Md.	Fifteen to fifty percent plants affected in at least four fields in southeast in 1917.
Va.	Reported for first time in 1917, causing slight to moderate losses in the eastern portion of state.
W. Va.	Found on one stalk in Mingo County, 1917.
Ky.	Fairly general in 1917. The highest percentage of infection observed was 68%. Damage slight.
Tenn.	Generally present in 1917. In some places, especially on bottom lands, the percentage of infection is high, as much as 5% loss was sustained.
N. C.	Reported as slight locally in 1914 and 1915. In 1917 general and fairly severe in some fields, particularly those in the Coastal Plain region.
S. C.	Reported by Barre in 1914. Was first observed by him at Lexington in 1911. Serious loss locally in 1914, 1915 and 1916. The survey in 1917 showed the disease to be present in the large majority of the fields. 100% affected plants was not uncommon and as high as 10% loss of grain was reported in many cases. Most severe in Coastal Plain area.
Ga.	First reported by Cereal Office, Bureau of Plant Industry, in 1910. Again reported in 1916. The 1917 survey showed the disease to be all over the state, being worst in the eastern and southern sections. The disease did not seem to be doing as much damage there as in South Carolina.
Fla.	Moderate to severe in 1916. Prevalent in corn section in 1917.

State	Occurrences 1912-1917
Ala.	Prevalent generally 1917. Most severe in the south on low lands but common all over state.
Miss.	Reported as slight locally in 1914 and 1915. In 1917 the survey showed it to be general and affecting a high percentage of the plants. In many fields practically every plant attacked. Average loss about 2.5%.
La.	Disease general in 1917 but apparently not as serious as in states to the east.
Tex.	1917. Occurred in slight amounts in the eastern portion only.
Okla.	1917. Slight occurrences locally. Not over 10% plants affected in any case.
Ark.	1917. Moderate amounts and fairly general.
Ohio	Reported by Selby from Wayne County 1912. In 1917 on bottom land in Ohio River Valley locally only.
Ind.	Found in southwestern quarter in 1917 in very small amounts. None reported from remainder of state. Loss very slight, mostly on bottom land.
Ill.	First reported by Barrett in 1912. Moderate in southern portion of state in 1917. Practically all on bottom land. As high as 52% of plants observed affected.
Iowa.	Very slight locally in 1917.
Mo.	Common and fairly general. Worst in southeast corner in 1917. As high as 90% infection observed.
Nebr.	In two counties in eastern portion in 1917. Very slight locally.
Kans.	Slight amount in eastern section in 1917. Reported by Melchers in 1915.
Minn.	One report from Winona in 1917.
S. Dak.	Reported from Yankton 1917. Very slight.

According to W. H. Tisdale the dry early season up to July 10 was unfavorable for Physoderma so that only slight damage was brought about anywhere in the South. Since that time rains have been frequent and the disease has made some progress. About 10% loss is now reported from parts of Union County, N. C., and in the mountain valleys of north Georgia and in the Coastal Plain section of that state many fields are reported with 100% infection. South Carolina reports it from every section of the state with considerable damage. In Alabama, Louisiana and Arkansas it is reported as being generally distributed but causing only slight loss. Oklahoma reports the disease as present locally.

Smut caused by Ustilago zeae.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918
Me.		.1%	Local and usually of little importance.
N. H.		1%	Local and unimportant.
Vt.		1%	General but of little account.
Mass.	Less than usual. Less than 1/2 % crop affected.	1%	General over state, of slight importance. Severe in 1908.
R. I.		.25%	Reports only for 1910 and at that time was general.
Conn.	About same as usual.	.25%	General and severe for the years 1904 and 1911. In 1917 local and doing little damage.
N. Y.	Prevalent generally, especially on sweet corn.	1%	Usually general in distribution and increasing in severity.
N. J.		1%	Present throughout corn growing region, being severe and in 1913 unusually severe.
Pa.	General. About 2% loss. Severe on sweet corn in some localities.	1%	General always. From 1910-13 incl. disease was severe. Since has been of slight importance.
Del.		2%	General and usually unimportant. 1915 and 1916 it was causing more damage than usual.
Md.	Usual amount.	1%	General and severe from 1905 to 1908 incl., the same also for 1912. Usually general but of slight importance.
Va.	Common but rarely more than 1%.	2%	Present throughout corn growing area but loss is small.
W. Va.	Probably not quite as common as last year. Is of considerable importance.	5%	Usually local and of little or no account.
Ky.		5%	Fairly abundant and causing a moderate amount of damage.
Tenn.		5%	General and of little importance except for the year 1913 when the injury was severe.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918
N. C.	General	3%	Generally present but not doing much damage except for the years 1905, 1913, 1914 when there was a moderate amount of damage.
S. C.		5%	General and growing in severity. Especially severe in 1917.
Ga.	General and severe. 5% loss for state.	2.5%	Local and of little account, but in 1907 it was very severe.
Fla.		2%	General.
Ala.	About usual amount. General. Apparently worse on late corn.	1.5%	General, but the loss due to this disease is very small.
Miss.		1%	General and of little importance.
La.	Common. About same as in other parts of country.	2%	Present throughout the corn growing sections, being severe only in 1905.
Tex.		4%	Last three years general and becoming severe.
Okla.	General and severe in some places.	8%	Generally present but reported as of little consequence except in 1917.
Ark.	Of little importance only.	1%	General but of very slight importance.
Ohio.	About same. General.	4%	General, usually severe. In 1907 reported locally to be very severe.
Ind.		4%	General, ranging in severity for different years. In 1913 and 1914 the disease was very severe.
Ill.	Rather more abundant than last year.	2%	Generally present, not reported as doing much damage. 1912 was severe.
Mich.	Extremely common. Especially bad this year in southern tier of counties.	3%	More or less present but unimportant.
Wisc.	About same as usual.	.5%	Generally distributed but causing very little trouble.
Minn.	About same as usual.	.6%	General, the past few years has been unimportant. Severe for 1905 and 1911.

State	Reports for 1918	1917 Loss	Summary of Reports prior to 1918
Iowa	Common. Most injury to sweet corn.	3%	General and on the average severe.
Mo.		2%	General and doing a moderate amount of damage.
N. Dak.	Much more common than ever before observed. A good deal on new lands.	2%	Has been very general and of a severe nature.
S. Dak.	Severe and general.	5%	Reports only for 1917 and they give it as general and very severe.
Nebr.	Unusually severe. 50% stalks affected in western part of state. Serious problem.	6%	General distribution. Unusually severe in 1906.
Kans.		8%	Local. In 1917 some localities were worse affected than others.
Mont.		1%	No data.
Wyo.		1%	No reports.
Colo.	More than in previous years. Very prevalent and severe, seldom less than 10% and many fields with 50%.	3%	General and severe for 1916 and 1917. Reported for 1911.
N. Mex.		8%	General as early as 1905 but at that time unimportant. 1915 and 1917 has been severe, with 1916 very severe.
Ariz.		3%	General and moderately severe in 1906. Reported in 1911 and 1917.
Utah		.5%	General and increasing in severity.
Nev.		.5%	Reported as local in 1915.
Idaho		.5%	Local and of little account.
Wash.	Prevalent locally.	.1%	Local and unimportant economically.
Oreg.		.1%	Local and fairly severe.
Cal.		.5%	General but not reported as doing much damage.
Canada	(Ontario) Much less plentiful than usual.		

Leaf Rust caused by Puccinia sorghi.

State	Reports for 1918	Summary of Reports prior to 1918.
Me.		Reported only for 1910 and then being local and severe.
N. H.		Local.
Vt.		Local and very severe for 1906. No detailed information since then.
Mass.	Common. Only slight damage.	Local and unimportant.
Conn.	Occasional, but not injurious.	
N. Y.		Local and of little account except for 1917 when it was reported severe locally.
N. J.	Scattered generally.	General and causing very slight damage.
Pa.	Present locally. Probably less than usual.	Local up to 1917 when it is reported as general and of moderate severity.
Del.		Local, unimportant, except for 1913 when it was very severe.
Md.	Usual amount.	Local, of little or no account.
Va.	Common but comes late in season and so does little or no damage.	Reported only for 1917 and at that time it was given as local and very severe.
W. Va.	Rather general but not important.	Local and doing no damage.
Ky.		General, increasing in severity
Tenn.		Abundant throughout state and very severe in 1917.
N. C.		More or less present at times but of no economic importance.
S. C.	Frequent, no serious damage.	General and of moderate severity
Ga.	General, loss less than 1%.	Locally very severe in 1915. Reports for no other years.
Fla.		General. Not important.
Ala.	Found in many cases but mostly on nearly mature plants.	General. Severe enough to make of economic importance for stat Locally very severe in 1905.

State	Reports for 1918	Summary of Reports prior to 1918
Miss.		General but of such severity as not to be of economic value.
La.	Very common and often causing considerable loss. Late corn badly affected.	General and worse than any other disease in state. Becoming very severe.
Tex.		Local and unimportant.
Okla.		Local. Severity is negligible.
Ark.	Very little this year compared with last when it was severe.	General and rather important. Very severe in 1917.
Ohio	General over state. No injury noticed.	General and important. At times severe.
Ind.		General and of such a degree of severity as to make it economically important at times.
Ill.		Local and unimportant.
Mich.	Common but causing no particular damage.	Local.
Wis.	Very prevalent, not much evidence of damage.	Local and unimportant.
Minn.	Somewhat more than normally but damage insignificant.	More or less present all the time but in very small amounts.
Iowa	Quite severe. More prevalent than usual.	General and very severe in 1905 and 1906, then came a period of moderate severity and for 1916 and 1917 it was of very slight importance.
Mo.		General but doing no damage.
N. D.	Especially common this year everywhere. Seldom reduces yield.	Local and unimportant.
Kans.		Local and moderately severe in 1917.
Nebr.	Serious on late planted corn and some fields of sweet corn only.	General but the loss due to this disease is very small. Very severe locally in 1906.

Corn Root and Stalk Rots caused by Fusarium spp.

During the past summer the Plant Disease Survey released the service of three field men for the special survey of root and stalk rots of corn. The men began their work in three different parts of the South and progressed northwards thru the corn belt states. Dr. J. C. Gilman was detailed to Georgia, and collected material in this state during June. During July 3-8 he collected in South Carolina, from July 10-27 in North Carolina, from August 1-8 in Missouri, from August 12-23 in Iowa, and August 24-30 in Wisconsin.

Dr. C. H. Otis surveyed corn fields in Louisiana from June 10-22, in Mississippi June 24-July 8, in Indiana from July 15-August 14, and in Ohio from August 19-30.

Prof. H. S. Stahl made observations and collected material in Texas from June 12-18, in Oklahoma from June 20-29, in Virginia from July 11-August 3, in Tennessee from August 6-16, in Kentucky from Aug. 17-23, in Minnesota Sept. 9-13, in South Dakota Sept. 15-17, in Kansas Sept. 19-23. Dr. C. R. Orton, collaborator, has furnished the data from Pennsylvania.

It will be noticed from the above dates that the corn fields in the more southern states were visited relatively early during the growth of the corn and it is for this reason that the phenomena of root rots, especially those of primary infections, will be reported chiefly as stunted plants and irregular stands. Most of these troubles are directly traceable to the use of infested or bad seed.

The results of secondary infections in corn in the southern states were not noted because the men did not return to the fields visited earlier in the season.

Stalk, or stem-rots, and root rot troubles have been reported at various times from Georgia, Mississippi and Louisiana. The survey this summer was of an extensive, rather than an intensive, nature, and the previous records are included in this report to emphasize the distribution, as well as to indicate the fact that root and stalk-rot troubles have been reported for some time.

Probably chief among the pathogenes causing these troubles are species of Fusarium. The material that was collected during the summer by the field men was sent into the central station at Purdue University Agricultural Experiment Station, Lafayette, Ind. This station is working in cooperation with the Office of Cereal Investigations.

Cultures of the multitudinous organisms obtained from these collections of root and stalk-rots have been made. The pathogenicity of these organisms will be tested and many of the attendant saprophytic species isolated will be discarded.

It is evident from the cultures obtained and from the observations reported on in this report that the root and stalk-rots of corn are of great importance, probably of greater importance than has been believed up to this time. The losses caused by these diseases cannot be estimated with accuracy, and it is for this reason that instead of attempting to estimate the losses, the approximate percentage of affected plants is given.

When stunted and barren stalks are mentioned under "symptoms", such plants represent total losses from the yield standpoint. Such stalks may still be used for fodder. When down-stalks are referred to, such stalks may have a marketable ear upon them, and consequently have both a yield and fodder value.

The fact that in the summary so many of the fields observed show such large numbers of missing hills and stunted plants cannot be too greatly emphasized in its relation to the use of poor and infested seed. The season of 1918 was notable because of the shortage of good seed corn, and the results of the summary may be of use to pathologists in stimulating the selection of disease-free seed.

G. N. Hoffer, Collaborator,
Plant Disease Survey.

Summary of Root and Stalk Rot Survey, 1910.

State, Observer, Date	Counties visited	No. fields observed.	Approx. total acreage	Severity and estimated per cent affected plants.	Symptoms	Remarks:
Pennsylvania, C. R. Orton, Sept. 13-19	Alleghany, Clarion Armstrong, Indiana.	8	50	Moderate 35%	Stunted, wilted, barren and down stalks observed.	Both sweet corn and yellow dent varieties observed. Yellow Bantam and Early Evergreen showed the largest amounts of injury. Orton estimates 15% loss for state this year.
Virginia, Stahl, July 11-Aug. 3	Montgomery, Rockingham, Loudon, Clarke Orange, Campbell, Botetourt, Augusta, Rockbridge.	49	1394	Moderate, 10%	Poor stand and fallen stalks with rotted roots:	The use of poor seed may may account for much of the rot troubles noted in many of the fields.
Kentucky, Stahl, Aug. 17-30	Montgomery, Fayette, Scott, McCracken, Christian, Warren, Graves, Hardin.	30	780	Moderate 15%	Down stalks were most common symptom.	Poor seed and corn--after corn rotation seemed to account for root-rots when found.
Tennessee, Stahl, Aug. 6-17	Humphrey, Madison, Obion, Knox, McMinn, Coffee, Sumner, Maury:	25	735	Moderate, 14%	Withered and down stalks.	Some of the corn was damdamaged by drought. The root troubles were perhaps greatest in fields where corn follows corn. Neal's Paymaster seemed to be most susceptible.
North Carolina, Gilman, July 10-27	Montgomery, Wayne, Wake, Anson, Union, Guilford, Forsyth.	114	860	Very slight, 1 1/2%	Stunted plants.	Disease appeared in spots in various fields. Appeared to be more prevalent in fields planted continuously to corn.

South Carolina, Gilman, July 3-8.	Darlington, Oconee, Pickens, Richland.	38	160	Very slight 2%	Slight amount of barrenness.	Much injury due to root aphids and stalk borers. One field on river bottom contained 10% root rotted plants.
Georgia, Gilman, June 14-29	Floyd, Bartow, Lare, Clarke, Echols, Lowndes, Grady, Thomas, Brooks Bibbs, Muscogee, Fulton.	167	1781	Moderate, 10%	Irregular and poor stand in field.	Root rots more prevalent on the poorer soils that had received shallow plowing in preparation for planting.
Mississippi, Otis, June 24-July 8	Oktibbema, Madison, Pike, Walthal, Washington, Bolivar, Calhoun.	43	1112	Moderate, 12%	Poor stand and stunted plants.	Much poor seed used for planting, primary infections being unusually abundant. Hastings Prolific corn most affected. First reported by Dr. J. M. Beal in 1917 when down stalks were found abundantly in Madison County.
Louisiana, Otis, June 10-27	Ouachita, Caddo, Baton Rouge, Lafayette, Jefferson Davis, Calcasieu, Rapides.	63	563	Slight 5%	Stunted and barren stalks.	Davis Prolific corn seemed particularly susceptible. In 1915 Dr. Edgerton reported a bad epidemic of "Stem rot of corn". His estimate was 35% affected stalks.
Texas Stahl, June 12-18	McLennon, Brazos, Tarrant, Grayson,	18	440	Moderate 20%	Drought injury very common, root rot symptoms noted with difficulty. Suspected plants pulled and	Fields planted with poor seed had greatest numbers of stalks with roots rotted.

Oklahoma, Stahl, June 20-29	Payne, Logan, Bryan, Carter, Pittsburg, Muskogee.	35	770	Moderate 25%	Wilting and missing hills in checked corn	Root rots generally distributed. No varietal susceptibility noted.
Ohio, Otis, Aug. 19-30	Fayette, Pickaway, Fairfield, Wayne, Columbiana, Cuyahoga, Medina, Crawford, Allen, Miami.	50	583	Slight 6%	Stunted and down-stalks were chief symptoms noted.	Poor seed corn planted in many fields may explain presence of root rots. Disease worse on heavy clay soil where reduced stands were often found.
Indiana, Otis, July 15-Aug. 24.	Morgan, Monroe, Putnam, Henry, Delaware, Madison, Marion, Shelby, Johnson, Crawford, Lloyd, Jennings, Decatur, Rush, Knox, Daviess, Lawrence, Orange, Vigo, Tippecanoe, Carroll, Clinton, Fountain, Sullivan.	112	1987	Slight 5%	Stunted and barren plant: Down stalks common in certain fields.	Corn in Indiana was damaged by frost on June 23, being especially injured in the northwestern sections. The result was too thin stand in many fields in this region. Root rots especially common in fields planted with infested seed and in fields where corn is planted following corn.
Wisconsin, Gilman, Aug. 24-26	Dodge, Jefferson.	50	340	Very slight: 1%	Barren and stunted stalks.	Trouble most common in fields where infected seed had been used for planting. (G.N.H.)
Minnesota, Stahl, Sept. 9-13	Dodge, Lyon.	16	365	Slight 5%	Secondary rotting of roots. Premature ripening of corn.	Minnesota 13 was less affected than other varieties observed.

Iowa, Gilman, Aug. 12-20	Webster, Sac, Pottawattamie, Clarinda, Polk, Story, Blackhawk, Scott.	153	1275	Very slight ½%		Drought during the summer injured corn so root troubles were recognized with difficulty.
Missouri, Gilman, Aug. 1-8	Mississippi, Scott, St. Charles, Chariton: Carroll, Nodaway, Holt.	136	2280	Very slight 2%	Slight number of barren stalks.	Troubles confined to the lighter soils.
South Dakota, Stahl, Sept. 15-17	Turner, Beadle.	10	315	Moderate 30%	Premature death of stalks.	White flint corn more affected than white and yellow varieties observed.
Nebraska, Stahl, Sept. 19-23	Dodge, Gage, Richardson.	14	460	Severe 30%	Barren and down stalks.	Secondary root rotting was responsible for many down stalks in some fields observed.
Kansas, Stahl, July 1-6	Norris, Lyon, Anderson.	11	440	Moderate 25%	Stunted and dead stalks.	Drought made estimate of injury difficult.